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Publications by Jared Miller

I. Journal Papers (published)

1) J. Miller and M. Sznaier, "Bounding the Distance to Unsafe Sets with Convex Optimization," *IEEE Transactions on Automatic Control*, vol. 68, no. 12, pp. 7575 – 7590, 2023. [link]
2) J. Zheng, T. Dai, J. Miller, and M. Sznaier, "Robust Data-Driven Safe Control using Density Functions," *IEEE Control Systems Letters*, vol. 7, pp. 2611–2616, 2023. [link] (LCSS-CDC)
3) J. Miller and M. Sznaier, "Data-Driven Gain Scheduling Control of Linear Parameter-Varying Systems using Quadratic Matrix Inequalities," *IEEE Control Systems Letters*, vol. 7, pp. 835–840, 2022. [link] (LCSS-ACC)
4) J. Miller, Y. Zheng, M. Sznaier, and A. Papachristodoulou, "Decomposed structured subsets for semidefinite and sum-of-squares optimization," *Automatica*, vol. 137, pp. 110–125, 2022. [link]
5) J. Miller, D. Henrion, and M. Sznaier, "Peak Estimation Recovery and Safety Analysis," *IEEE Control Systems Letters*, vol. 5, no. 6, pp. 1982–1987, 2021. [link] (LCSS-ACC)
6) J. Miller, M. A. Al-Radhawi, and E. D. Sontag, "Mediating Ribosomal Competition by Splitting Pools," *IEEE Control Systems Letters*, vol. 5, no. 5, pp. 1555–1560, 2021. [link] (LCSS-ACC)

II. Journal Papers (submitted)

1) J. Miller and M. Sznaier, "Analysis and Control of Input-Affine Dynamical Systems using Infinite-Dimensional Robust Counterparts," 2023. [link]
2) J. Miller, M. Tacchi, M. Sznaier, and A. Jasour, "Peak Value-at-Risk Estimation of Stochastic Processes using Occupation Measures," 2024. [link]
3) J. Miller, M. Tacchi, D. Henrion, and M. Sznaier, "Unsafe Probabilities and Risk Contours for Stochastic Processes using Convex Optimization," 2024. [link]
4) J. Miller and M. Sznaier, "Peak Estimation of Hybrid Systems with Convex Optimization," 2023. [link]
5) J. Miller, T. Dai, and M. Sznaier, "Data-Driven Stabilizing and Robust Control of Discrete-Time Linear Systems with Error in Variables," 2023. [link]

III. PhD Thesis

1) J. Miller, *Safety Quantification for Nonlinear and Time-Delay Systems using Occupation Measures*. PhD thesis, Northeastern University, April 2023. [link]

IV. Conference Proceedings (published)

1) J. Miller, T. Dai, and M. Sznaier, "Superstabilizing Control of Discrete-Time ARX Models under Error in Variables," *IFAC-PapersOnLine*, vol. 56, no. 2, pp. 2444–2449, 2023. 22nd IFAC World Congress
2) J. Miller, T. Dai, and M. Sznaier, "Data-Driven Superstabilizing Control of Error-in-Variables Discrete-Time Linear Systems," in *2022 61st IEEE Conference on Decision and Control (CDC)*, pp. 4924–4929, 2022. [link]
3) J. Miller and M. Sznaier, "Bounding the Distance of Closest Approach to Unsafe Sets with Occupation Measures," in *2022 61st IEEE Conference on Decision and Control (CDC)*, pp. 5008–5013, 2022. [link]
4) F. Bečanović, J. Miller, V. Bonnet, K. Jovanović, and S. Mohammed, "Assessing the Quality of a Set of Basis Functions for Inverse Optimal Control via Projection onto Global Minimizers," in *2022 IEEE 61st Conference on Decision and Control (CDC)*, pp. 7598–7605, 2022. [link]
5) J. Miller and M. Sznaier, "Facial Input Decompositions for Robust Peak Estimation under Polyhedral Uncertainty," *IFAC-PapersOnLine*, vol. 55, no. 25, pp. 55–60, 2022. [link]
6) J. Miller, D. Henrion, M. Sznaier, and M. Korda, "Peak Estimation for Uncertain and Switched Systems," in *2021 60th IEEE Conference on Decision and Control (CDC)*, pp. 3222–3228, 2021. [link]
7) J. Miller, R. Singh, and M. Sznaier, "MIMO System Identification by Randomized Active-Set Methods," in *2020 59th IEEE Conference on Decision and Control (CDC)*, pp. 2246–2251, 2020. [link]
8) J. Miller, Y. Zheng, M. Sznaier, and A. Papachristodoulou, "Decomposed Structured Subsets for Semidefinite Optimization," in *2020 21st IFAC World Congress*, 2020. [link]
9) C. Wu, J. Miller, Y. Chang, M. Sznaier, and J. Dy, "Solving Interpretable Kernel Dimensionality Reduction," in *Advances in Neural Information Processing Systems* (H. Wallach, H. Larochelle, A. Beygelzimer, F. d'Alché-Buc, E. Fox, and R. Garnett, eds.), vol. 32, pp. 7915–7925, Curran Associates, Inc., 2019. [link]
10) J. Miller, Y. Zheng, B. Roig-Solvas, M. Sznaier, and A. Papachristodoulou, "Chordal Decomposition in Rank Minimized Semidefinite Programs with Applications to Subspace Clustering," in *2019 IEEE 58th Conference on Decision and Control (CDC)*, pp. 4916–4921, 2019. [link]
11) J. Miller and B. Shafai, "A Model of Heave Dynamics for Bagged Air Cushioned Vehicles," in *2019 IEEE Conference on Control Technology and Applications (CCTA)*, pp. 976–981, 2019. [link]
12) B. Taskazan, J. Miller, U. Inyang-Udoh, O. Camps, and M. Sznaier, "Domain Adaptation Based Fault Detection in Label Imbalanced Cyberphysical Systems," in *2019 IEEE Conference on Control Technology and Applications (CCTA)*, pp. 142–147, 2019. [link]

V. Conference Proceedings (accepted)

1) J. Miller and R. Smith, "Peak Estimation of Rational Systems using Convex Optimization," 2024. 2024 European Control Conference (ECC) [link]
2) J. Miller, J. Zheng, M. Sznaier, and C. Hixenbaugh, "Data-Driven Superstabilization of Linear Systems under Quantization," in *2024 American Control Conference (ACC)*, 2024. [link]
3) J. Miller, M. Tacchi, M. Sznaier, and A. Jasour, "Peak Value-at-Risk Estimation for Stochastic Differential Equations using Occupation Measures," in *62nd IEEE Conference on Decision and Control*, 2023. [link]
4) J. Miller, T. Dai, M. Sznaier, and B. Shafai, "Data-Driven Control of Positive Linear Systems using Linear Programming," in *62nd IEEE Conference on Decision and Control*, 2023. [link]
5) J. Miller, M. Korda, V. Magron, and M. Sznaier, "Peak Estimation of Time Delay Systems using Occupation Measures," in *62nd IEEE Conference on Decision and Control*, 2023. [link]

VI. Conference Proceedings (submitted)

1) M. Abdalmoaty, J. Miller, M. Yin, and R. S. Smith, "Frequency-Domain Identification of Discrete-Time Systems using Sum-of-Rational Optimization," 2023. [link]

VII. Preprints

1) J. Miller and M. Sznaier, "Quantifying the Safety of Trajectories using Peak-Minimizing Control," 2023. [link]

2) T. Imtiaz, M. Kohler, J. Miller, Z. Wang, M. Sznaier, O. Camps, and J. Dy, "SAIF: Sparse Adversarial and Interpretable Attack Framework," 2022. [link]

VIII. Seminars

1) "Data-Driven Safety Quantification using Robust Optimization," October 18, 2023, Cybernetic Systems and Controls Lab (CSCL), Arizona State University, Tempe, AZ. [link].
2) "Risk analysis for stochastic processes using polynomial optimization," October 15-18, 2023, Convex Relaxations for Polynomial Optimization, INFORMS Annual Meeting, Phoenix, AZ [link].
3) "Data-Driven Safety Quantification using Robust Optimization," October 11, 2023, Safe Autonomy and Intelligent Distributed Systems (SAIDS) group, University of Southern California, Los Angeles, CA. [link]
4) "Data-Driven Safety Quantification using Infinite-Dimensional Robust Convex Optimization," July 27, 2023, Konstanz Real Algebraic Geometry Seminar, University of Konstanz. [link]
5) "Data-Driven Safety Quantification using Infinite-Dimensional Robust Convex Optimization", May 29, 2023, Student Seminar Series on Optimization, Control & Learning, UC San Diego. [link]
6) "Quantifying Safety under Uncertainty using Occupation Measures", May 26, 2023, Control Seminars @ UCI, UC Irvine
7) "Data-Driven Safety Quantification using Infinite-Dimensional Robust Convex Optimization", May 19, 2023, Multi-Robot Systems Lab Meeting, Stanford University. [link]
8) "Analysis and Control of Time-Delay Systems Using Polynomial Optimization", May 14, 2023, MS14 Studying Dynamics using Polynomial Optimization Tools, SIAM Conference on Dynamical Systems. [link]
9) "Data-Driven Control under Input and Measurement Noise", April 9, 2023, Oden Institute Seminar, UT Austin. [link]
10) "Safety Quantification for Nonlinear and Time-Delay Systems using Occupation Measures", April 3, 2023, PhD Thesis Defense, Northeastern University. [link]
11) "Data-Driven Control under Input and Measurement Noise", NYU MERIIT Lab Seminar Series, New York City, Feb 21, 2023. [link]
12) "Bounding the Distance to Unsafe Sets with Convex Optimization", DCSD Rising Stars, 2nd Modeling, Estimation and Control Conference, Jersey City, October 2-5 2022. [link]
13) Tutorials about Convexity, Interior Point Methods, Frank-Wolfe algorithms (with applications to system identification), and Polynomial Optimization, June 27, 2022, From Data to Control, Israeli Association of Automatic Control (with M. Sznaier). [link]
14) "Bounding distances to unsafe sets", June 16, 2022, IfA Coffee Talks, ETH Zurich. [link]
15) "Bounding distances to unsafe sets", June 14, 2022, LA3 Meeting, EPFL Lausanne. [link]
16) "Bounding distances to unsafe sets", June 3, 2022, Journées SMAI MODE, University of Limoges (XLIM). [link]
17) Tutorials about Interior Point Methods, Polynomial Optimization, Frank-Wolfe algorithms and variations, and SDP approximations, May 16-20, Sparsity and Big Data in Control, Systems Identification, and Machine Learning, European Embedded Control Institute.
18) "Bounding distances to unsafe sets", April 14, 2022, Conic Linear Optimization for Computer-Assisted Proofs, Mathematisches Forschungsinstitut Oberwolfach (MFO). [link]
19) "Bounding distances to unsafe sets", June 28, 2021, Brainstorming days on measure and polynomial optimization (BrainPOP), LAAS-CNRS. [link]
20) "Data-Driven Peak and Reachability Set Estimation", May 25, 2021, MS112 Methods of Learning Dynamical Systems for Control, SIAM Conference on Dynamical Systems. [link]
21) "Analysis and Control of Time-Delay Systems with Occupation Measures", May 3, 2021, BrainPOP, LAAS-CNRS. [link]
22) "Exploiting Structure in Rank-Constrained and Approximated Semidefinite Programs", December 19, 2019, TISEM Operations Research Seminar, Tilburg University. [link]

IX. Seminars (upcoming)

1) "Data-Driven Safety Quantification using Robust Optimization," February 16, 2024, Institute for Systems Theory and Automatic Control (IST), University of Stuttgart, Stuttgart, DE. Institute for Systems Theory and Automatic Control (IST), University of Stuttgart, Stuttgart, DE.
2) "Risk Analysis of Stochastic Processes using Auxiliary Functions," April 11, 2024, Laboratory of Signals and Systems (L2S), Paris-Saclay, FR.

X. Poster Sessions

1) "Risk Analysis of Stochastic Processes using Polynomial Optimization." November 13, 2023, Future Trends in Polynomial Optimization, LAAS-CNRS, Toulouse, FR. [link]
2) "Frequency Domain Identification via Sum-of-Rational Optimization." September 25, 2023, European Research Network System Identification (ERNSI), Stockholm, SE. [link]
3) "Safety Analysis and Control using Measures." April 13, 2023, RISE 2023, Northeastern University. [link]
4) "Safety Analysis and Control using Measures." February 27, 2023, PhD Research Expo, Northeastern University. [link]
5) "Diameter Constrained Minimum Spanning Graphs." January 31, Current Themes of Discrete Optimization: Boot-camp for early-career researchers, ICERM. [link]
6) "Safety Analysis using Distance Estimation and Measures." August 24, 2022. CLEVR-AI MURI Yearly Review Meeting, Northeastern University. [link]
7) "Exploiting SDP Structure Yields Tighter Approximations." April 9, 2020. RISE, Northeastern University (remote). [link]
8) "Exploiting SDP Structure Yields Tighter Approximations." February 24, 2020. IPAM Control, Learning and Optimization workshop, University of California, Los Angeles. [link]
9) "Chordal Decompositions in Rank Minimized SDPs." May 30-31, 2019. Learning for Decision and Control (L4DC), Massachusetts Institute of Technology. [link]
10) "Chordal Decompositions in Rank Minimized SDPs." May 10, 2019. New England Machine Learning Day, Northeastern University. [link]
11) "Scattered data interpolation through B-spline wavelets and the Elastic Net." April 14, 2017. RISE, Northeastern University. [link]
12) "A parallelized Python-based Multi-Point Thomson Scattering analysis in NSTX-U." October 29, 2014. 56th Annual APS Plasma Physics Conference, New Orleans. [link]